Characterisation of possible Low Countries Glazed Red Earthenwares from sites in Gateshead

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Samples of three glazed red earthenware vessels from sites in Gateshead were submitted for analysis (Table 1). The vessels are in a style made popular in England during the 16th and 17th centuries through the importation of earthenware vessels from the Low Countries and the presence in Eastern England of immigrants from the Low Countries. However, within a very short time of the first importation of these wares they were being copied locally, in some cases clearly by immigrant potters. Any vessels which differ in form or fabric from the norm must therefore be treated as potentially Dutch-influenced English products.

Table 1

TSNO	SITECODE	CONTEXT	REFNO	ACTION	DESCRIPTIO
V1668	msg99	131		TS;ICPS	SPLASH GLAZE ON RIM INT ONLY;BLACKENED/REDUCED SURF
V1669	L99/100	271	1246	TS;ICPS	INT GL (REDUCED PLAIN) ON OXID MARGINS, GREY CORE
V1670	BB97	1049		TS;ICPS	

The three vessels from various sites in Gateshead belong to this questionable category. In order to establish their likely origin samples were thin-sectioned and chemically analysed, using Inductively Coupled Plasma Spectroscopy. All three have a fine, sandy texture with few inclusions over 0.5mm across. Such fabrics are difficult to study using thin-sections but their relative homogeneity in texture makes chemical analysis more useful than with coarser wares.

Petrological analysis

The three samples can be grouped into two fabric groups. V1668 and V1669 have a very similar fabric whereas V1670 is rather different.

V1668 and V1669

The thin-sections reveal the following inclusions:

- Abundant angular quartz up to 0.2mm across
- Sparse rounded quartz grains, some of which have iron-stained veins, up to 0.3mm across.
- Sparse rounded altered glauconite up to 0.3mm across

- Sparse rounded opaque grains up to 0.3mm across.
- Sparse rounded grains of fine-grained sandstone or siltstone up to 0.3mm across.
- Sparse muscovite laths up to 0.3mm long.
- Sparse angular flint up to 1.0mm long.
- A groundmass of isotropic baked clay minerals and sparse angular quartz up to 0.1mm.

V1670

This section contained the following inclusions:

- Abundant rounded quartz up to 0.2mm across
- Moderate rounded quartz up to 0.3mm across
- Moderate rounded clay pellets, some of similar texture and colour to the groundmass, others lighter up to 1.5mm across
- Sparse rounded brown-stained chert grains up to 0.3mm across
- Sparse rounded opaque grains up to 0.5mm across
- A variegated groundmass containing abundant angular quartz up to 0.1mm across

Discussion

The rounded quartz grains with iron-stained veins, the flint and the altered glauconite are all likely to come from Cretaceous rocks. Such rocks occur in Denmark and in the British Isles south of Flamborough Head but are absent from the Gateshead area. V1668 and V1669 cannot, therefore, have been locally made. Such inclusions are common detrital minerals from Denmark down to Normandy.

Sample V1670 does not contain any of these types but does contain rounded fragments of brown-stained chert, probably of Carboniferous origin. However, such material is also widely distributed in detrital sands and offers no clear evidence for the source of the vessel which might as easily be of local manufacture and of Low Countries origin (or elsewhere in northwest Europe).

Chemical analysis

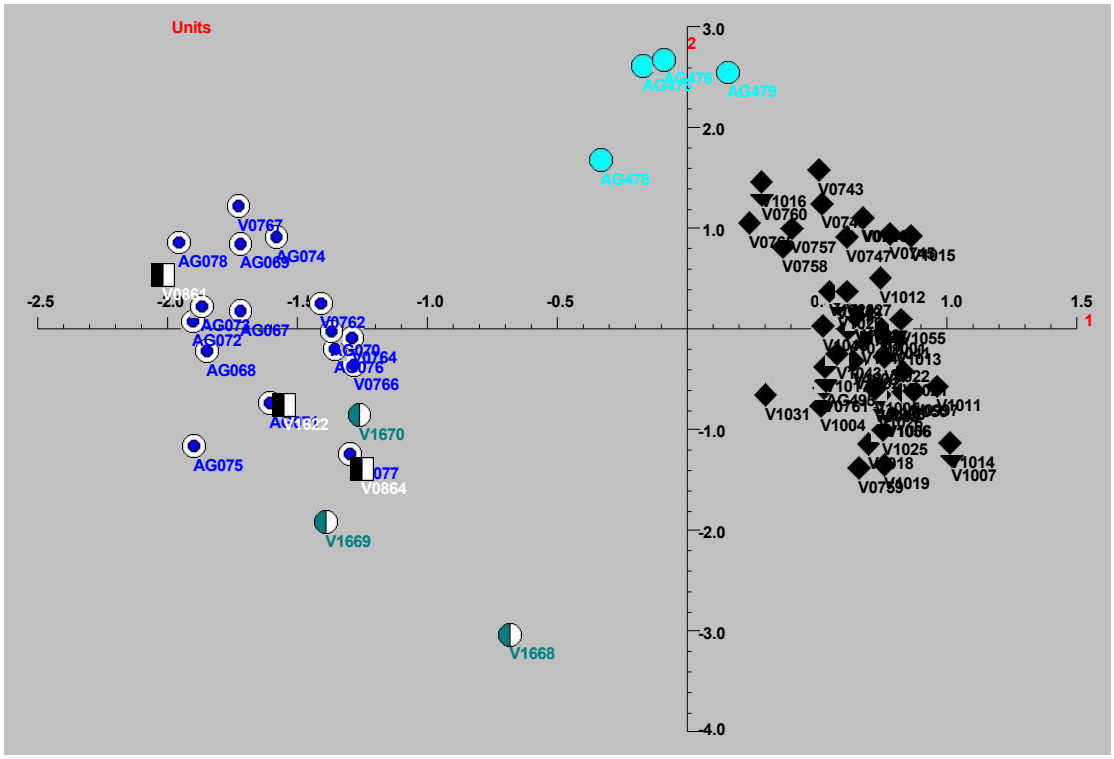

Figure 1

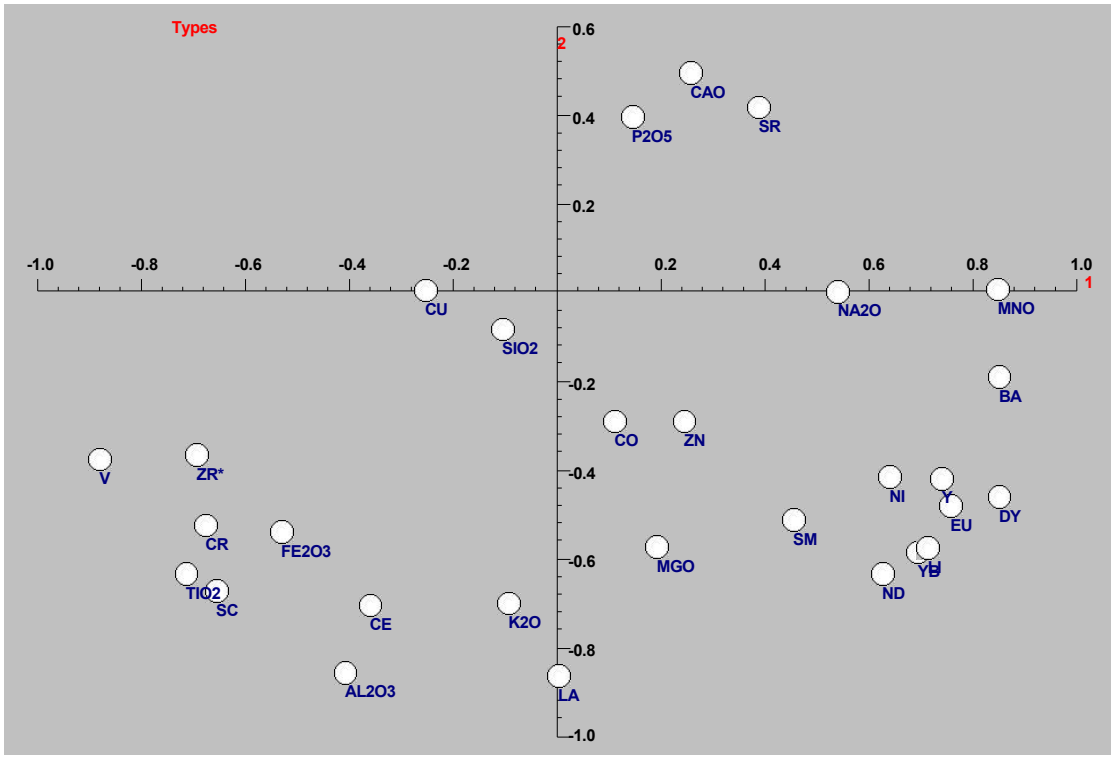

Figure 2

A range of major, minor and trace elements were measured using ICPS at the Department of Geology, Royal Holloway College, London. The major elements were measured as percent oxides and the remainder as parts per million.

The data were examined using Principal Components Analysis. In this method, the similarity between records (samples) is calculated and expressed as a series of Components, each consisting of a range of weightings assigned to each measured element. Thus, for this dataset PC1 has high positive weightings for MnO, Ba and Dy and high negative weightings for V, Zr, TiO, Cr and Sc. PC2 has high positive weightings for CaO, P2O5 and Sr and high negative weightings for Al2O3 and La. The analysis depends very much on the exact data which is included, so that the inclusion of samples with radically difference composition will cause other samples to appear more similar, and vice versa.

In this case, samples of the three glazed ware vessels were analysed alongside a range of Low Countries ceramics:

- Highly decorated glazed wares (once called Aardenburg type but now known to have been made at other sites, including Bruges)
- Low Countries Greyware (unglazed greywares known to have been made in several parts of the Low Countries, including Bruges).
- Flemish Shelly ware (samples all from Kent, but identified as Flemish through typology and manufacture)
- Flemish earthenware floor tiles

A plot of PC1 versus PC2 shows that the data falls into two groups (Fig 1 and Fig 2). The first (high negative PC1 and neutral to negative PC2) contains the highly decorated glazed wares, the Low Countries Greyware and the Gateshead glazed wares. The second contains the Flemish shelly ware and the Flemish floor tiles, each of which has a distinctly different composition.

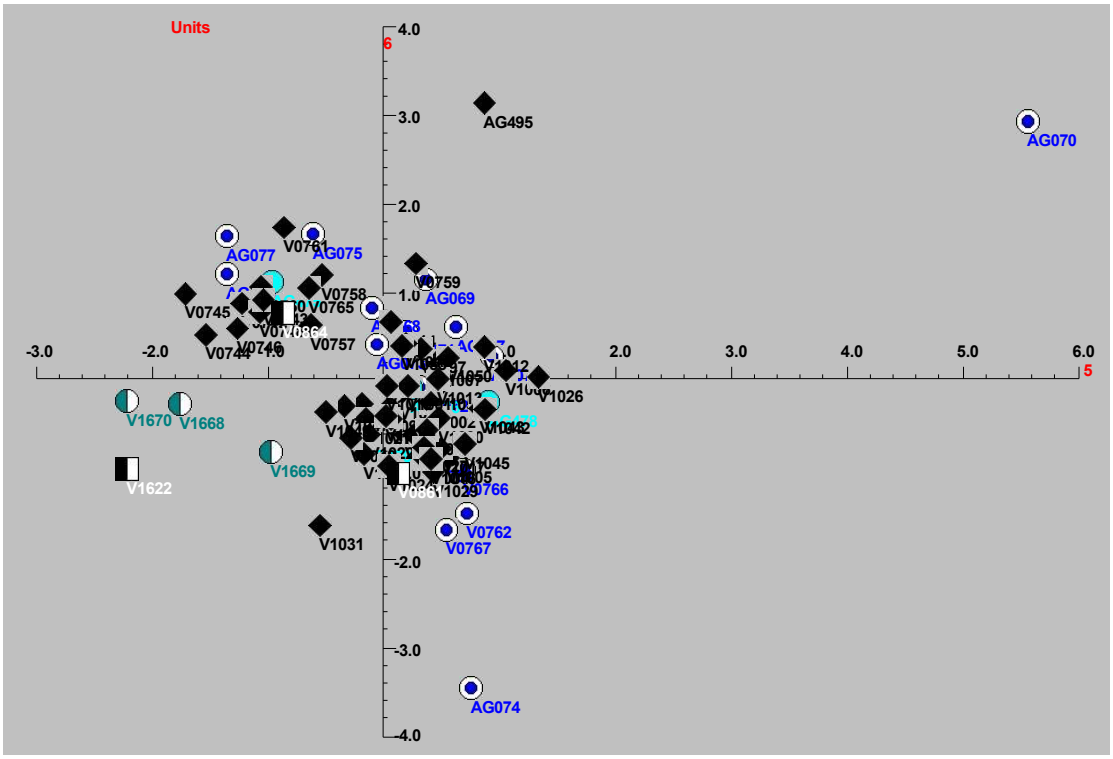

Figure 3

The Gateshead samples plot to one site of the Low Countries group with V1670 and V1669 falling within the range of the other samples and V1668 plotting outside the cluster. A plot of PC3 and PC4 emphasises the difference between the calcite-rich shelly wares and the remainder, with the Gateshead samples falling squarely into the non-shelly cluster. A plot of PC5 against PC6, however, differentiates the Gateshead samples from the remainder (Fig 3). This is apparently due in the main to Zn and SiO and to negative Na2O and MgO. A similar result is obtained from plotting PC8 and PC5, apparently due to high Sm (Figs 4 and 5).

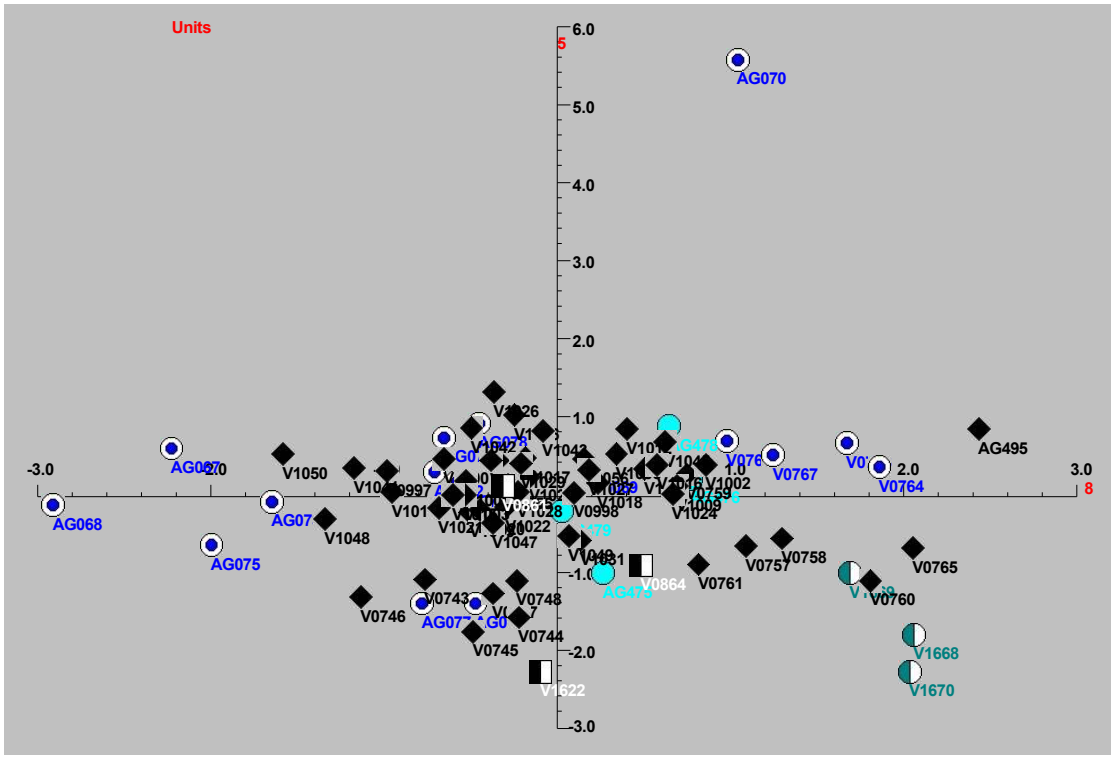

Figure 4

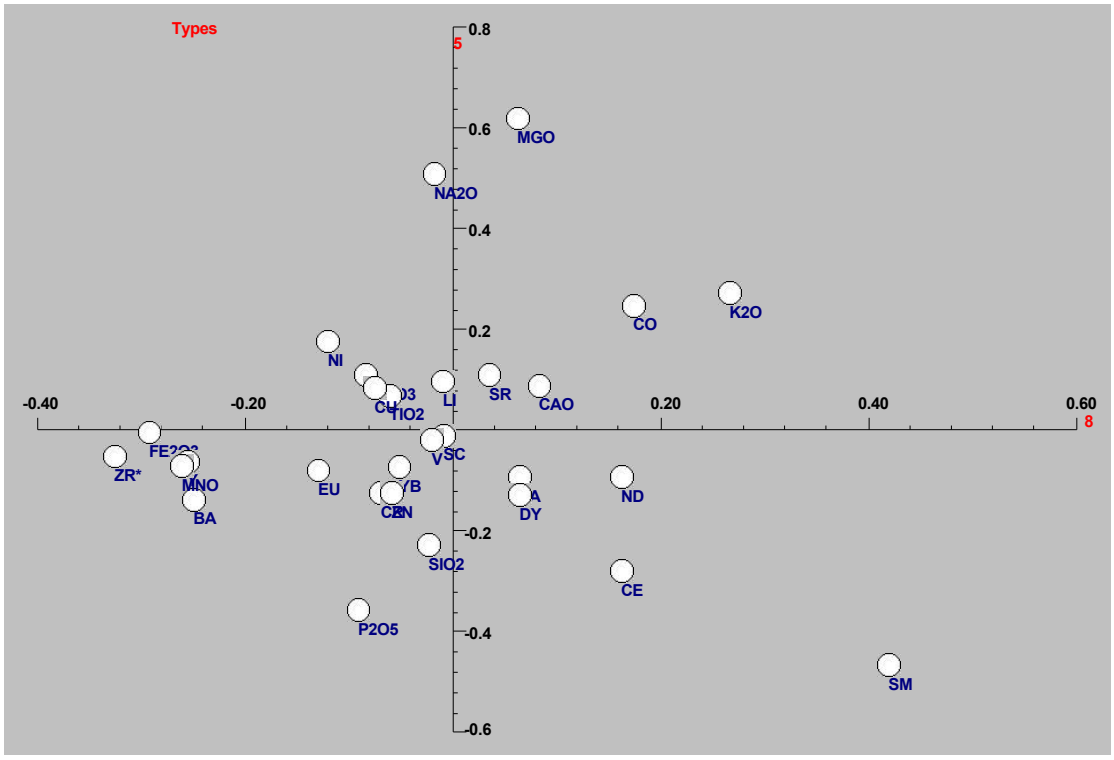

Figure 5

Finally, the dataset was reanalysed including data from a study of Scandinavian/North German glazed red earthenwares and excluding the Flemish tiles and shelly wares. This showed a separation between a group consisting of the Low Countries wares and the Gateshead redwares and one containing samples from Lubeck, Lund, Husum and unglazed Jutish ware from Gateshead and Viborg. A group of glazed

red earthenware samples from Luneborg, however, grouped with the Low Countries wares. However, the Luneborg samples could be distinguished from the Low Countries vessels by PC3, which depends partly on the frequency of TiO and V, which are higher in the Low Countries samples.

In summary, the chemical data shows that all three Gateshead samples have a similar chemical composition and that they are most similar to Flemish glazed and unglazed earthenwares and least similar to Flemish shelly wares and floor tiles and to Scandinavian glazed red earthenwares. This is in itself unsurprising since the floor tiles are made in a calcareous silty clay and the shelly wares, obviously, have a high calcium content and little quartzose sand. The case for the Gateshead samples all being from the same source is perhaps more persuasive given that despite these clear fabric differences they can be differentiated from the remaining samples. Whether that source was in Flanders or further north is not certain but it would be worth comparing their composition with that of the products of Bergen op Zoom, for example, which is known to have produced glazed red earthenwares for export in the post-medieval period.

Conclusions

The petrological analysis demonstrates that two of the three Gateshead redware samples are definitely not locally made. However, the third, V1670, contains only rocks and minerals which could be found locally although the small size of the inclusions in comparison to those found in the Dogbank kiln wares, for example, makes it impossible to demonstrate certainly that the vessel is a local copy of a Low Countries form. The chemical analysis, however, shows that V1670 is chemically much more similar to the remaining two redwares than to any of the analysed local wares (all of which are much coarser-textured fabrics and much earlier in date). Furthermore, the three samples form a chemical group which is consistent with the three samples coming from the same source and, furthermore, suggests that the source is likely to be in the Low Countries. Nevertheless, it would be useful in the future to compare V1670 with samples of fine-textured wares of definite northeastern English origin as well as obtaining samples of glazed red earthenware from Bergen op Zoom and other known Low Countries glazed red earthenware sources for comparison with all three Gateshead samples.

Appendix 1

Major elements (percent oxides)

TSNO	SIO2	AL2O3	FE2O3	MGO	CAO	NA2O	K2O	TIO2	P2O5	MNO
V1668	71.920	15.821	6.260	1.850	0.330	0.180	2.700	0.800	0.120	0.019
V1669	73.273	14.860	6.060	1.740	0.350	0.180	2.670	0.770	0.080	0.017
V1670	75.265	14.220	5.090	1.040	0.370	0.420	2.690	0.680	0.210	0.015

Minor and trace elements (ppm)

TSNO	BA	CO	CR	CU	LI	NI	SC	SR	V	Y	ZN	ZR*	LA	CE	ND	SM	EU	DY	YB
V1668	347	16	117	34	82	44	18	88	155	24	96	63	38	73	39.950	8.248	1.287	4.500	2.200
V1669	354	15	113	36	62	36	17	88	147	18	95	63	37	69	37.976	6.088	0.897	3.400	1.700
V1670	381	10	117	28	55	32	14	88	132	16	73	51	35	68	35.814	5.982	0.846	3.100	1.600